

REMARKS

Applicants amend claim 1 to incorporate the subject matter of claim 4. Claim 4 is canceled. Claim 5 is amended. Support for amendments to claim 5 can be found throughout the Specification and specifically at page 9, line 18- page 10, line 13 and Figure 1. No new matter is added. Upon entry of this amendment, claims 1-3 and 5-11 are presented for examination, of which claims 1 and 6 are independent. Applicants respectfully submit that claims 1-3 and 5-11 define over the art of record.

I. Rejection of Claims under 35 U.S.C. § 112

Claim 5 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Specifically, the Examiner indicates that there is insufficient antecedent basis for the limitation “said coolant supply passage” recited in claim 5.

Applicants amend claim 5 to recite that the fuel cell includes a coolant supply passage and a coolant discharge passage. Applicants believe amendments to claim 5 address the Examiner’s concerns.

Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the rejection of claim 5 under 35 U.S.C. § 112, second paragraph.

II. Rejection of Claims under 35 U.S.C. § 103

Claims 1, 2, 4-7, 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2001/0044042 by Inoue et al. (hereafter “Inoue”) in view of Japanese Patent Application Publication No. JP 2000-164230 by Sha et al. (hereafter “Sha”).

Claims 3 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue reference and the Sha reference and further in view of U.S. Patent No. 5,077,148 to Schora et al. (hereafter “Schora”).

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue reference and the Sha reference further in view of Japanese Patent Application Publication No. JP 10-106594 by Kurita et al. (hereafter “Kurita”).

The present invention generally concerns substantially triangular inlet/outlet buffers provided on a separator of a fuel cell. A reactant gas flow field is formed for supplying a reactant gas along an electrode surface. The reactant gas flow field includes a plurality of serpentine flow grooves having substantially the same length. A substantially triangular inlet buffer connects the serpentine flow grooves and a reactant gas supply passage extending through the fuel cell in a stacking direction of the fuel cell. A substantially triangular outlet buffer connects the serpentine flow grooves and a reactant gas discharge passage extending through the fuel cell in the stacking direction of the fuel cell. The inlet buffer and the outlet buffer are formed substantially symmetrically with each other.

As correctly indicated by the Examiner the Inoue reference is silent towards the use of substantially triangular inlet or outlet buffers which are symmetric. *See Office Action, page 4.* The Examiner refers to the Sha reference for the teaching of this feature.

The Sha reference teaches a fuel cell separator including an inlet side flow groove 11 positioned at an inlet side 3, an outlet side flow groove 12 positioned at an outlet side 4 and an intermediate flow groove part 14 positioned between them. *See Abstract and Figure 1.* The flow grooves 11 and 12 of the Sha reference have a triangular shape. However, the triangular flow grooves 11 and 12 of the Sha reference do not have the same size, and thus cannot be symmetrical.

Regarding independent claim 1, the Sha reference, alone or in combination with Inoue reference, does not teach or suggest that *one side of the inlet buffer and one side of the outlet buffer are substantially perpendicular to terminal portions of the serpentine flow grooves*, as recited in amended claim 1. Specifically, one side of the flow grooves 11 and 12 of the Sha reference are not substantially perpendicular to terminal portions of the serpentine flow grooves.

Regarding claim 3, the reactant gas supply passages 1 and 2 of the Sha reference do not have an oblique side. Thus, the oblique side of the reactant gas supply passages of the Sha reference does not face the oblique side of the flow grooves 11 and 12. The Examiner refers to the Schora reference for the teaching of gas supply passages with an oblique side. *See Office Action, page 6, § 8.* However, the Schora reference merely indicates that the manifold holes shown in Figure 2 of the Schora reference have a triangular shape. *See Col. 9, lines 25-29 and*

Figure 2. The Schora reference, alone or in combination with the Sha reference, does not teach that the oblique sides of the reactant gas supply passages face the oblique sides of the buffers. Specifically, combining the Sha reference with the Schora reference will simply result in gas supply passages 1 and 2 of the Sha reference having an oblique side. However, the oblique sides of the flow grooves 11 and 12 of the Sha reference do not face the gas supply passages 1 and 2.

Regarding independent claim 6, the Examiner asserts that the combination of the Inoue and Sha references teaches the use of triangular buffers at the inlet and outlet regions of the flow grooves and reactant gas supply passage. *See Office Action, page 5.* However, even if it can be assumed that the Sha reference teaches triangular buffers, the combination of the Inoue and Sha references still fails to teach a *buffer with one side connected to the reactant gas supply passage on the one surface of the metal separator, and another side connected to the coolant passage on the other side of the metal separator, and a still another side connected to the reactant gas flow field and the coolant flow field on both surfaces of the metal separator*, as recited in claim 6.

A buffer having a structure recited in claim 6 has the function of distributing the reactant gas in the reactant gas flow field, and the function of distributing the coolant in the coolant flow field. Thus, it is possible to simplify and downsize the buffer structure.

Claim 10 which recites that one side of the buffer is substantially perpendicular to a terminal portion of the reactant flow field is also patentable for the reasons set forth above.

Claims 2, 3 and 5 depend from claim 1. Claims 7-11 depend from claim 6. Dependent claims incorporate each and every element of the independent claim upon which they depend. In light of the arguments presented above, Applicants respectfully submit that the cited references reference does not disclose each and every element of independent claims 1 and 6, thus claims 2, 3, 5 and 7-11.

Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of claims 1-3, 5 and 6-11 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. TOW-099US. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

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